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John Hunter : Surgeon and Naturalist

BY

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JOHN HUNTER: SURGEON AND NATURALIST *

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"WHY THINK? WHY NOT TRY THE EXPERIMENT?"

PROFESSOR JOHN CHIENE,† whose apt maxims of surgical practice still ring in the ears of those of us who were fortunate to be his pupils, was wont to advise us to avoid becoming mere "hewers of wood and drawers of water." Such counsel would have delighted John Hunter who, with a vision far ahead of his time, laboured to prevent surgery from becoming an affair of carpentry and plumbing.

In the present era of specialism and super-specialism it is indeed salutary to recall this great figure of medical history, and although the work of John Hunter has been the theme of a dozen biographers and nearly a hundred Hunterian Orators, the remarkable story remains of perennial interest.

Parentage and Youth

John Hunter, the youngest of a family of ten children, was born on 14th February 1728, at the farm of Long Calderwood, some seven miles south-east of Glasgow. His father, already an old man, died when John was ten years old, and he remained in the care of an indulgent mother and appears to have been a "spoiled child." It is indeed remarkable that such a genius, at the age of seventeen, could neither read nor write. But, as is well known, the brilliant schoolboy does not always fulfil the promise of early years, and, conversely, the boy who has no inclination for scholarship may grow to be a clever man. John Hunter was one who blossomed late; nevertheless his education did progress, although along unusual lines, for in his own words he "wanted to know all about the clouds and the grasses, and why the leaves changed colour in autumn: I watched the ants, bees, birds, tadpoles and caddisworms; I pestered people with questions about what nobody knew or cared anything about." His sister Janet, eldest of the surviving children, had married a Mr Buchanan, a Glasgow cabinet-maker. To him John was apprenticed, as it appeared obvious

* Address to the Royal Medical Society on 28th November 1941.

† Professor of Surgery, University of Edinburgh, 1882-1909.

Douglas Guthrie

that his livelihood must be gained by handicraft rather than by scholarship. But as John Hunter grew to manhood his ambition became at length aroused, and indeed it is uncertain whether he was engaged in woodwork for more than a short time.

Early Days in London

At the age of twenty he joined his brother William in London, and entered upon a career which became steadily more strenuous and more fruitful of results until his death, forty-five years later. William, ten years his senior, was already making a name for himself as an anatomist and obstetrician, a strange combination to our way of thinking but not unusual at that time.

William Hunter was originally destined for the Church, and he had received a good education before he came under the spell of Dr William Cullen, who practised medicine in the town of Hamilton, and who afterwards became Professor of Medicine in the University of Edinburgh. After assisting Cullen for several years, William Hunter went to London, and there he lived with Dr Smellie, of Lanark, who had come to London two years previously and was already a successful accoucheur and apothecary, with a shop in Pall Mall.

William Hunter also assisted Dr John Douglas, the anatomist, whose name survives in the "pouch of Douglas," and he succeeded him as lecturer in Anatomy a few years later. It is interesting to note that William Hunter became a member of the Royal Medical Society in 1775.

An older brother, James, who had been a Writer to the Signet in Edinburgh, forsook Law for Medicine and joined his brother William, embarking upon a career of great promise. Unfortunately, however, he was stricken with pulmonary tuberculosis and returned home to die at the age of twenty-nine years. A sister, Dorothea Hunter, married Rev. Dr James Baillie, who became Professor of Divinity at Glasgow. Of this marriage were born three children—Matthew, a distinguished physician of London and one of John Hunter's trustees; Joanna, who made a name for herself in literature and was a friend of Sir Walter Scott; and Agnes, who, "if not distinguished in life, was at least tenacious of it," as she died in her 101st year.

Certainly the Hunter family possessed brains, and there

John Hunter : Surgeon and Naturalist

can be no doubt that William, himself a great man, blazed the trail for his greater and more brilliant young brother, John. John set out from Glasgow and arrived in London in September 1748, after a journey on horseback which occupied about a fortnight. William gave him an arm to dissect, just as many a student commences with "the upper limb" to-day, and the excellence of his work was immediately apparent. It was William who sent John to study surgery under Cheselden at Chelsea Hospital, and under Percival Pott, of fracture fame, at St Bartholomew's; subsequently he was a house surgeon at St George's Hospital. For a short time he was in Oxford, as it was deemed necessary that he should have some acquaintance with the classics, but this was an unsuccessful experiment. John Hunter preferred to study the book of Nature. The two brothers worked together in London for a time, discovering the lachrymal ducts and the tubuli seminiferi and making researches on congenital hernia and on the circulation in the placenta, until a misunderstanding and estrangement arose which lasted until William's death. William is often quoted as having said on his deathbed, "If I had the strength to hold a pen I would write how pleasant and easy a thing it is to die." Commenting later upon those "last words," John Hunter remarked, "Ay, but it is a poor thing when it comes to that."

Ottley, whose *Life of John Hunter* has influenced all subsequent biographers, tells us that "Jack" Hunter, as he was then called, was "not very nice in the choice of his associates," and that he was a favourite with the "resurrection men," mingling with them in the theatre galleries in order "to damn the productions of unhappy authors."

On Military Service

But let us return to the early struggles of brother John. In 1759, eleven years after his arrival in London, he developed symptoms of tuberculosis and he was advised to seek some rest in a warmer climate. Doubtless remembering the fate of his elder brother James, he took the advice, but gave it a somewhat original interpretation by enlisting in the Army, truly a graceful compliment to the Medical Corps of that time. England had become involved in the Seven Years War and was about to lay siege to Belleisle, near the mouth of the Loire. Staff-Surgeon John Hunter accompanied this expeditionary force, and in

Douglas Guthrie

the following year he went to Portugal, to whose aid, threatened with invasion by France and Spain, the British force had proceeded. Belleisle and Portugal afforded valuable experience to John Hunter, for not only did he acquire first-hand experience of gunshot wounds, but in the intervals of fighting he studied the flora and fauna of the countries and added continually to his knowledge. He made experiments on lizards, forcing food into their stomachs and noting that it remained undigested during the period of hibernation. He also investigated the hearing organ of fishes, as he mentioned in his paper of that title to the Royal Society some years later. Indeed, his four years of foreign service must have given John Hunter ample opportunity to indulge his favourite study of comparative anatomy.

Life at Golden Square and at Earl's Court

We have only a scanty record of the eight years which intervened between his military service and his marriage, but we know that they were very busy years. On his return to civilian life in 1763, John Hunter had resumed, or rather commenced, practice in Golden Square. He opened a room for dissecting and taught classes in Anatomy. At first the classes were small, the number of students at no time exceeding thirty, for he was never a good lecturer, and it is said that on one occasion he asked the porter to bring in the skeleton so that he might preface his remarks with the word "Gentlemen." The lectures were given from 7 to 8 P.M. on alternate evenings during the winter months.

Ottley tells us that "he appeared to little advantage as a lecturer; his language was inelegant and often coarse, his delivery heavy and unengaging, as he rarely raised his eyes from his book." It was said that he used to calm himself with a dose of laudanum before his lecture. Nevertheless, he schooled himself to lecturing, as he felt that the practice was of benefit to himself as well as to his hearers. His insistence upon accurate observation is shown by a remark to a student who was taking notes, "You had better not write down that observation, for very likely I shall think differently next year." He had been in practice for ten years, had been made a Fellow of the Royal Society, had been appointed Surgeon to St George's Hospital, and had married and succeeded to his brother William's house in Jermyn Street, before he commenced the

John Hunter : Surgeon and Naturalist

first course of lectures on Surgery, which contained the fruit of much study and hard thinking and comprised "the whole circle of the sciences round Surgery." In the notice he stated that the course would include "so much of the Animal Economy as may be necessary to illustrate the Principles of those Diseases which are the object of Surgery." His pupils included Abernethy, Physick, Astley Cooper and Cline, and further details will presently be given of his long friendship with his most famous student, Edward Jenner.

Practice came slowly to Hunter, but he made good use of the time and was never unemployed. Indeed, he appeared to regard private practice as an unfortunate necessity, and in that respect resembled a more modern physician who remarked that "medicine would be intensely interesting if it were not for those damned patients." John Hunter's remark to a friend, was, "Well, Lynn, I must go and earn the damned guinea, or I shall be sure to want it to-morrow." It was during these early days of practice that Hunter commenced those vast researches in comparative anatomy and physiology to which the rest of his life was to be devoted. He argued that in order to understand the nature of disease it was necessary first of all to study the structure and functions of healthy tissue, not in man alone, but in the whole animal series and even also in plants. "Instead of referring to the discoveries detailed in books, he appealed directly to Nature herself, and rested nothing upon the facts related by others until, by the evidence of his own senses, he had ascertained their truth."

As such a programme of research could scarcely be carried out in the centre of a city, John Hunter acquired a small piece of ground and a house at Earl's Court, which was then in the country, two miles from London. Here he kept all sorts of animals and birds and fishes. There was a pond for the fish and a den, or "dug-out," for the more dangerous animals, among which were two leopards, which created a lively diversion by attempting to escape on one occasion. Another inmate was a bull which the Queen had given him, and with which one day he had been wrestling, when he was thrown down and might have been seriously injured had not one of his servants come to his aid. Mention of bulls reminds one that it was said that Hunter used to drive down Piccadilly in a cart drawn by two buffaloes, showing that he was not without

Douglas Guthrie

his eccentricities ! He kept rabbits, pigs, goats, dormice, hedgehogs, opossums, a jackal, a zebra and other animals. Of birds, there were fowls, ducks and geese, and there were silkworms and hives of bees.

Around the house was a covered area about six feet below the level of the ground, which was excellent for keeping small animals in cages and for the rough work of anatomy. It must have been an unsavoury spot, for here were dissected, among many other creatures, the whales on which Hunter contributed a paper to *Philosophical Transactions of the Royal Society*. Like many other anatomists, Hunter was greatly interested in whales. He would have appreciated "Moby Dick." He even engaged a surgeon, at considerable expense, to accompany a Greenland whaler in order to collect material, but his only return was "a bit of whale's skin, with some barnacles sticking to it."

The size of the anatomical "subject" intrigued him. "The heart of the spermaceti whale appears prodigious," he tells us, "the aorta measuring a foot in diameter. When we consider these facts applied to the circulation and figure to ourselves that 10 to 15 gallons of blood are thrown out at one stroke, the whole idea fills the mind with wonder." In his *Curiosities of Natural History*, Frank Buckland relates the following tale regarding Hunter's most famous technical assistant, William Clift :

"Some years before I was born, a large whale was caught at the Nore, and towed up to London Bridge, the Lord Mayor having claimed it. When it had been at London Bridge some little time, the Government sent a notice to say the whale belonged to them. Upon which the Lord Mayor sent answer, 'Well, if the whale belongs to you, I order you to remove it immediately from London Bridge.' The whale was therefore towed downstream again to the Isle of Dogs, below Greenwich. The late Mr Clift, the energetic and talented assistant of his great master, John Hunter, went down to see it. He found it on the shore, with its huge mouth propped open with poles. In his eagerness to examine the internal parts of the mouth, Mr Clift stepped inside the mouth, between the lower jaws, where the tongue is situated. This tongue is a huge spongy mass, and being at that time exceedingly soft, from exposure to air, gave way like a bog ; at the same time he slipped forwards

John Hunter : Surgeon and Naturalist

towards the whale's gullet, nearly as far as he could go. Poor Mr Clift was in a really dangerous predicament ; he sank lower and lower into the substance of the tongue and gullet, till he nearly disappeared altogether. He was short in stature, and in a few seconds would, doubtless, have lost his life in the horrible oily mass, had not assistance been quickly afforded him. It was with great difficulty that a boat-hook was put in requisition, and the good little man hauled out of the whale's tongue."

That Hunter was also attracted by the infinitely small is proved by his experiment with bees, in which he discovered that wax was secreted by the insect and not collected, like the honey, as had been imagined. "The wax is formed by the bees themselves ; I have found that it is formed between each scale on the under side of the belly." It is told of Hunter that on one occasion a pupil who wished to see him was told to call at the early hour of 4 A.M. and then found him dissecting beetles ! "I want everything respecting the bee tribe," he wrote to a correspondent in Africa, "such as wasps and their nests, also hornets and theirs." His "Observations of Bees," read at the Royal Society a year before his death, was a masterly contribution revealing long and patient study. He used to say that his head was like a beehive, an expressive metaphor when one realises the multiplicity of the problems he investigated.

In his house at Earl's Court there was a large copper tank, used for preparing skeletons, the most famous of which was that of Bryne, or O'Brien, the Irish giant. He was 8 feet 4 inches in height, and was wont to light his pipe from a street lamp. Bryne had learned that John Hunter coveted his bones, and he therefore left strict orders that on his death his body should be guarded day and night until, enclosed in a leaden coffin, it was buried at sea. On hearing of the death of Bryne, Hunter set forth to interview the men engaged to watch the body. He began by offering them £50 if they would allow the corpse to be kidnapped, but they said they must have a hundred. Hunter agreed, but when the men found him so eager they increased their demands and continued to do so until they raised the price to £500 !

The feet of the skeleton thus acquired appear in the famous portrait of John Hunter by Sir Joshua Reynolds which now

Douglas Guthrie

adorns the Royal College of Surgeons. Of this portrait is told the following tale: As might be expected, Hunter was a restless sitter, and Reynolds was almost in despair until one day Hunter, as he sat, became immersed in thought. The artist at once turned the canvas upside down and painted a new head between the legs of the figure he had already drawn. The engravings of the portrait, by William Sharp, were greatly in demand and have become relatively rare.

Another portrait of John Hunter, by his brother-in-law, Robert Home, is now in the possession of the Royal Society, and it shows him seated, his hand resting on the head of a large dog.

Ottley paints his portrait in words thus: "In person he was about the middle stature, of a vigorous and robust frame, and free from corpulency. His shoulders were high, and his neck short. His features were rather large and strongly marked; his eyebrows projecting, his eyes of light colour, his cheeks high and his mouth somewhat underhung. In dress he was plain and gentleman-like; and his hair which in youth was of a reddish-yellow, and in his later years white, he wore curled behind."

Marriage and Family

In July 1771 John Hunter married Anne Home, the daughter of a former fellow-officer, Mr Robert Boyne Home, surgeon to Burgoyne's Regiment of Horse and afterwards of Greenlaw Castle, Berwickshire. John Hunter was forty-three, and Anne Home twenty-nine, and there is no doubt it was a happy union, although Anne loved gaiety while John must have been "gey ill to live wi'" at times. In order to defray the expenses of his marriage, John Hunter published his first work, *On Diseases of the Teeth*. She was a clever and handsome lady, fond of lively society, a taste which sometimes conflicted with her husband's studious life, as on the occasion when he returned home to find his house full of guests. "I knew nothing of the kick-up," he announced, ". . . but as I am now returned home to study I hope the present company will retire!"

Mrs Hunter was more than a mere consort of her distinguished husband. She published a volume of poems and wrote the lyric, "My Mother bids me bind my hair," which, set to

John Hunter : Surgeon and Naturalist

Haydn's music, has become immortal, and she also wrote the words for Haydn's "Creation."

The Hunters had four children. Two died in childhood. The elder survivor, John, entered the army, but did not marry ; the younger, Agnes, was twice married but had no issue. Thus the family of John Hunter became extinct.

Mrs Hunter survived her husband for twenty-seven years and died at the age of seventy-nine.

Friendship with Jenner

"I don't know anyone I would as soon write to as you. I do not know anybody I am so much obliged to." Those words were written by John Hunter to his friend and former pupil, Edward Jenner, who practised at Berkeley in Gloucestershire. Jenner had spent two years in the household of John Hunter as one of his resident pupils, and was one of the small coterie who revered John Hunter as the "dear man." It is fortunate that many of Hunter's letters to Jenner have been preserved. Jenner carried out all manner of experiments and investigations at Hunter's suggestion and also kept him supplied with material. Of this there is ample evidence in the letters. "I thank you for your experiment on the hedgehog," wrote Hunter on 2nd August 1775, "but why do you ask me a question by the way of solving it? I think your solution is just; but why think? Why not try the experiment? Repeat all the experiments on a hedgehog as soon as you receive this . . . and let me know the result." The experiments upon the hedgehog to which he refers were a part of an investigation on the vital heat of animals and plants. It must be remembered that the clinical thermometer was not then in use and Hunter constructed his own thermometers. Hunter sought to prove the thesis "that living bodies possess a power of maintaining their heat against the influence of external cold, and this in degree proportioned to their rank in the scale of organisation."

Not only did Jenner record the temperature of the hibernating hedgehog, but he sent hedgehogs to London, where they did not always survive.

Condoning Jenner in regard to a love affair, Hunter wrote, "Let her go, never mind her. I shall employ you with hedgehogs." Another letter gives one a glimpse of animal tragedies

Douglas Guthrie

at Earl's Court : " If you could send me a colony of hedgehogs, I should be glad, as I have expended all I had except two ; one an eagle ate, and a ferret caught the other. I am hedgehogless." Apparently the hedgehog was Hunter's laboratory animal, his guinea-pig in fact, and it is interesting to note that quite recently the hedgehog has again been pressed into the service of the laboratory (" New Laboratory Animals from Wild Species," R. M. Ranson, *Journal of Hygiene*, vol. 41, No. 2, Sept. 1941).

Hedgehogs were by no means the only creatures referred to in this correspondence. Together, Hunter and Jenner studied the mating habits of the cuckoo (that peculiar bird, still a subject of controversy), the spawning of salmon, the life story of eels, the plumage of blackbird nestlings and their feather patterns, the temperature of growing trees, and many another problem.

Hunter at one time proposed that Jenner should return to London and collaborate with him in founding a school of comparative anatomy, but Jenner declined the invitation. There is something idyllic about this friendship of pupil and teacher, of city surgeon and country practitioner, and there can be no doubt that Jenner was inspired by Hunter, although his discovery of vaccination was not announced until after Hunter's death.

The Museum in Leicester Square

Throughout his life in London John Hunter was a keen collector. Nevertheless, he built up his great collection on a definite plan, designed to illustrate the whole range of comparative anatomy, physiology and pathology.

For many years he worked almost incessantly to accumulate and study the 13,600 specimens which the museum eventually contained at the time of his death. This represents, as Hey Groves has told us in his Oration of 1930, one specimen for each day of his life. " How many," asks Hey Groves, " would continue this self-imposed slavery right up to the end, even when fame and fortune smiled upon them ? " " Ah, John, you are always busy," said Dr Gartshore who had called and found him, as ever, at work. " Yes," was the reply, " and when I am dead you will not soon meet another John Hunter."

John Hunter : Surgeon and Naturalist

John Hunter did not set out to make a fortune. He gave his services freely to the poor, and to those in reduced circumstances he was always kindly and considerate in the matter of fees. He spent lavishly, and it is said that his museum must have cost him altogether some £70,000. Although he became the leading surgeon of London, his income never exceeded £5000 a year, and reached that figure only a few years before his death. The fact that he spent lavishly is shown by the price he paid (£500) for the skeleton of the Irish giant. All the money he could spare was devoted to the museum. He was a persistent beggar for any curio which pleased him, as is shown by the story of a specimen of an extrauterine gestation which was the pride of a certain Dr Clarke. "Come, doctor," said John Hunter, "I positively must have that preparation." "No, you positively shall not," was the reply. "Well, then," said John, "take care I don't meet you with it in some dark lane at night, for if I do, I'll murder you to get it."

Bland Sutton said in his Hunterian Oration for 1923 that the museum contained "everything, big and little, that Hunter could obtain; shrimps and sharks, tits and ostriches, shrews and whales, and of human kind, dwarfs and giants. It was . . . an anatomical Valhalla."

It is not surprising that his house in Jermyn Street soon proved too small to accommodate all his specimens and, as his practice was also increasing, he removed, in 1785, to larger premises in Leicester Square, or Leicester Fields, as it was then called. This was not only his home but also his consulting and lecture-rooms and his museum. A stuffed specimen of a giraffe, or camelopard, to use the current name, stood in his hall, but, even so, the entire creative world could not be accommodated, and John Hunter amputated its legs so that it might be more easily inspected. Although he had a good income, the upkeep of this establishment was very heavy, and it is not surprising that Hunter died a comparatively poor man, notwithstanding the fact, related in the biography by Adams, that such was the afflux of morning patients that they overflowed into the drawing-room. His door plate bore the plain legend "John Hunter."

Leicester Square and Earl's Court, between them, demanded a large staff, and it is recorded that the Hunter household, consisting of family, pupils, servants, gardeners and workmen,

Douglas Guthrie

formed such a goodly assemblage that there were never fewer than fifty persons daily provided for at Mr Hunter's expense. A detailed list of them is given in Stephen Paget's biography of Hunter.

Illness and Death

The sadder aspect of Hunter's life now falls to be recorded. In 1773, when he was forty-six, there occurred the first attack of angina pectoris, which ultimately caused his death. Few ordinary men could have survived the hard work and long hours which he imposed upon himself, and he seldom took more than four hours' sleep in the twenty-four. He was wont to remark that his life was in the hands of any rascal who chose to annoy him, knowing, as he did, that any worry or excitement might precipitate a seizure. In addition, we must accept Sir D'Arcy Power's view that John Hunter suffered from cerebral syphilis as the direct result of a somewhat foolhardy experiment upon himself. This took place in 1767 when, seeking to ascertain whether gonorrhœa and syphilis were one and the same disease, he inoculated himself with pus from a patient, and this was followed by typical manifestations of syphilis which under mercurial treatment took three years to "cure." There is no reason to believe that he transmitted the disease to his wife or family, his marriage taking place five years after the infection, but the angina pectoris and the cerebral symptoms were almost certainly of syphilitic origin. His illness has been described in detail by his brother-in-law, Sir Everard Home, who acted as his assistant in the later years. The first of the cerebral attacks appeared in 1777, four years after the first anginal attack, when "he had no sooner lain down than he felt as if suspended in the air, and soon after the room appeared to go round . . . and the quickness of motion became very rapid. . . . The idea he had of his own size was that of being only two feet long, and when he drew up his foot, or pushed it down, it appeared to be moving a vast way. . . . He could not bear the least light, . . . his hearing was also painfully acute." At the end of ten days the symptoms gradually abated, the vertigo persisting for some weeks.

The attacks of angina continued, however, until in 1786 they occurred almost daily. Two years later cerebral trouble was again manifest, and he suddenly was stricken with complete

John Hunter : Surgeon and Naturalist

loss of memory, which lasted for half an hour. A fortnight later, while making a round of professional visits, he was seized with sickness and vertigo. Again there were the peculiar symptoms now known as "Lilliputian hallucinations," for, according to Home, "objects were smaller than the natural recollection of them, his idea of his own size was that of being only four feet high; objects also appeared to be at an unusual distance as if seen through a concave glass." For a week he could not raise his head from the pillow; recovery was slow and some impairment of memory persisted until his death.

As was to be expected, the end came suddenly. On 16th October 1793 he was attending a meeting of Governors of St George's Hospital, and a question arose regarding the eligibility of two young Scottish students who wished to attend the hospital. Having had no previous medical training, they were debarred from attendance, according to the existing rule. John Hunter spoke in support of the candidates. During his speech he made a statement which one of his colleagues at once contradicted. Hunter, seeking to suppress his anger, ceased speaking, staggered into an adjoining room and fell dead. Thus died the great John Hunter, on the very day, curiously enough, that Marie Antoinette was beheaded in Paris.

He was buried in St Martin's-in-the-Fields and there his body remained until 1859, when it was reinterred in Westminster Abbey. This reburial took place at the instance of Frank Buckland, whose four little volumes of *Curiosities of Natural History* are still well worth perusal. Buckland, reading in *The Times* that the vaults of St Martin's Church were to be built up and closed, immediately obtained permission to search for Hunter's remains. For sixteen days he searched among the 3260 coffins, hardly a task to be envied, for he tells us that "the sickly effluvia which emanated from these vaults were truly overpowering and poisonous." In No. 3 vault, where Hunter was believed to be buried, there were over 200 coffins. Amid the piles of coffins revealed by the light of his bull's-eye lantern were those of another John Hunter and of a Mrs John Hunter, both burials of more recent date. At last there were only five coffins to examine and one of them was that of John Hunter. This was re-interred on 25th March 1859 in Westminster Abbey by the Royal

Douglas Guthrie

College of Surgeons, who erected a suitable memorial and conveyed to Mr Buckland their thanks for his valuable services in honouring so illustrious a man.

William Clift and Sir Everard Home

John Hunter was careless in matters of money. At his death his estate yielded only £1500. His widow was granted a civil list pension until the museum, in accordance with his wishes, was offered for sale to the Government. But times were hard, and Pitt, the Prime Minister, retorted "Buy preparations? We have hardly money to buy gunpowder." It was not until 1799 that the collection was purchased for £15,000 and placed in the custody of the Royal College of Surgeons. In the interval it remained at Leicester Square, guarded by the faithful William Clift who, out of respect for his master, remained as custodian for the beggarly salary of 7s. per week and occupied himself in transcribing the large mass of Hunter's unpublished manuscripts. It was fortunate that he did so, because when the museum was transferred to the Royal College of Surgeons, Sir Everard Home removed to his own house what was literally a cartload of manuscripts, in order, he said, that they might be better examined and cared for. There they remained until 1823, when Sir Everard Home burned them all, and nearly set fire to his house in the process. He alleged that John Hunter had instructed him to destroy the manuscript notes, but unfortunately there is strong reason to suppose that in the twenty-three years' interval he had made use of the material for his own advancement. Fortunately, Clift had laboriously copied out nine volumes of notes and some twenty other monographs, and these were subsequently published under the editorship of Sir Richard Owen.

William Clift (1775-1849), whose name has already been mentioned in Buckland's story of the decomposing whale, was a Cornish boy who, at the age of seventeen, had entered the service of the Hunter household only the year prior to John Hunter's death. He was the first Curator of the Hunterian Collection, and he was succeeded by his son-in-law, Sir Richard Owen (1804-1892), the eminent comparative anatomist and palaeontologist.

John Hunter : Surgeon and Naturalist

John Hunter's Legacy to Mankind

It is not easy to explain the secret of Hunter's greatness nor to assess the results he achieved during his strenuous life in London. The fact that he published nothing until his forty-third year indicates the accuracy of his researches and his meticulous adherence to his rule of proving all things. His papers to the Royal Society were prepared with scrupulous care, although his style of writing is sometimes trying to the reader. He made no definite discovery, and yet, in a sense, he was the originator of many discoveries. The pioneer may not find the largest nugget, but at least he shows where gold may be found. Although he was a skilful surgeon, operating was distasteful to him. In his lectures he states that "to perform an operation is to mutilate a patient whom we cannot cure by other means, and it should therefore be considered as an acknowledgement of the imperfection of our art."

Nevertheless, his operation of ligature at a distance, of ligation of the femoral artery in "Hunter's canal" in the treatment of popliteal aneurysm was the means of saving many limbs. His experiments of grafting a spur or a human tooth into the comb of a cock were the precursors of the modern procedure of bone-grafting. By his investigations on the developing embryo in the eggs of geese he advanced the science of embryology. On many other subjects did he write—on bees, on whales, on the blood and inflammation, on post-mortem digestion of the stomach, on the gizzard or Gillaroo trout, on electric organs in fishes, on animal heat and on the olfactory nerves. He also wrote descriptions of the Kangaroo, the Potoroo (Kangaroo rat) and the Wha Tapoua Roo (Phalanger), specimens of each having been sent to him from New South Wales. Some of the papers were collected and reprinted under the title *Animal Economy* in 1786, while his *Lectures on Surgery* were published under the editorship of Mr James F. Palmer, Surgeon to St George's Hospital, in 1835.

The construction of the Museum* was an achievement which would have brought fame to any man. But neither the writings nor the museum represent the end-result of John Hunter's labours. This fact has been stressed by many

* Almost completely destroyed by enemy action in May 1941.

Douglas Guthrie

Hunterian Orators. Sir James Paget, in 1877, said that although he was unequalled as a comparative anatomist, he did more by the questions he set than by the answers he worked out. Indeed, the true value of Hunter's discoveries is to be found in the number of the discoveries to which they have given birth. The Orator of 1899, Sir William MacCormac, remarked that "the surgery of the Middle Ages was a trade. Ambrois Pare and Jean Louis Petit converted it into an art; John Hunter elevated it to the rank of a science. Lister crowned the edifice whose corner-stone John Hunter laid."

In our own time (1932) perhaps the most brilliant of all Hunterian Orators, Mr Wilfred Trotter, pointed out that Hunter achieved greatness not as surgeon or as discoverer but by his example in the use of the scientific method, and wrote of him : "He saw, as from a peak in Darien, the illimitable ocean of biology before him and he addressed himself unhesitatingly to explore it all."

Never content to remain a "hewer of wood" or "drawer of water," John Hunter, by his originality of thought, raised Surgery from the level of a technical accomplishment to that of a defined science, securely based upon physiology and pathology. Indeed, he may be regarded as the founder of surgical pathology. He improved the status of the surgeon, and he reunited Medicine and Surgery, which had been progressing along diverging lines.

It is a good thing to remember such men. It would be a matter of great regret if the student could pass through his five or six years of training without knowing at least a few leading facts regarding the lives and times of some of the great leaders of medicine in the past. To make no provision for lectures on the History of Medicine would be surely a short-sighted policy. It is true that the student is already overburdened with masses of detail, but an occasional lecture on the rise and progress of medical science would not only add interest to the routine subjects, but might serve also as a stimulus and as a refreshment. That is why I have ventured to submit to this great and honoured Society some account of the life and work of John Hunter.

John Hunter : Surgeon and Naturalist

BIOGRAPHIES OF JOHN HUNTER

Life of John Hunter, Sir Everard Home, 1794.

The Life of John Hunter, Jesse Foot, 1794.

Life and Doctrines of the late John Hunter, Joseph Adams, 1817.

Life of John Hunter, Drewry Ottley, 1835.

Memoir of John Hunter, Sir William Jardine, 1843. (Vol. X of Naturalists' Library.)

Two Great Scotsmen, William and John Hunter, George Mather, 1893.

John Hunter, Stephen Paget, 1897. (Masters of Medicine Series.)

Memoirs of William and John Hunter, George A. Peachey, 1924.

and many shorter biographical notices in Hunterian Orations and elsewhere

